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QUARTERLY REPORT ON

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INCLUSIVE DATES 5 August 1962 TO 4 November 1962

SUBJECT OF INVESTIGATION

ON THE GROWTH MECHANISM
OF
PSITTACOSIS-TRACHOMA VIRUSES
IN
TISSUE CULTURES,

RESPONSIBLE INVESTIGATOR

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1. Results obtained

Intracellular changes of the trachoma virus after infection was as follows. The unusual bodies quite different from the infected elementary bodies in size, shape and structure were first seen 15 hours following infection. They were occurred within the intracytoplasmic matrix area. They were larger than the elementary bodies, irregular in shape and made up of rather homogeneous reticulated material. They were designated as reticulated bodies. Succeedingly in the reticulated bodies there developed two or more daughter reticulated bodies. These bodies came to maturity to form smaller elementary bodies with a nucloid.

In order to study on the intracellular localization of nucleic acids synthesized after meningopneumonitis virus infection, H^3-cytidine was added in the infected cultures at various time intervals and the presence in the infected L cells was determined by the technique of microautoradiography. H^3-cytidine added 10 hours after infection was incorporated only in the matrix area. After digestion with RNase of infected cells, intracellular isotope was almost washed off with 0.2M cold perchloric acid.

Effect of Mitomycin C on the growth of meningopneumonitis virus in strain L cells was examined. At the concentration of 1.0 μg per ml final virus infectivity was reduced to 10^{-3} PFU. When 1.0 μg ml of this agent was added between 2 and 15 hours after infection, there was no synthesis of infectious elementary bodies but when it was added 19 hours after infection, elementary bodies developed.

2. Conclusions

a. The trachoma virus seemed to arise independently of the other from the matrix material and the formation of the reticulated bodies can be represented as a differentiation of the matrix material in the sense of condensation, progressive formation of limiting membrane. There was no immediate morphological continuity between the infected elementary bodies and the reticulated bodies and there was no evidence that the reticulated forms multiply by binary fission which had been suggested so far.

b. Micro-autoradiography indicated that RNA synthesis after meningopneumonitis virus infection occurred in the matrix area. RNA synthesis may be associated with reticulated bodies.

c. Mitomycin C had inhibition effect on the growth of meningopneumonitis virus when it added during the lag period.

3. Contemplated research activity for the next quarter

Electron microscopic studies of the very early stage of trachoma virus infection will be carried out.

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